Notes.

The general meeting of the Linnean Society on June 17 will be devoted to a celebration of the centenary of Sir Joseph Banks (1743–1820) with essays on various aspects of his life-work, and an exhibition.

Dr. H. D. Curtis, astronomer at the Lick Observatory, has been appointed director of the Allegheny Observatory in succession to Dr. Frank Schlesinger, who assumed charge of the Yale Observatory on April 1.

The Linnean Society has elected the following as foreign members:—Prof. Gaston Bonnier, Prof. Victor Ferdinand Brotherus, Prof. Giovanni Battista de Toni, Prof. Louis Dollo, Prof. Paul Marchal, and Prof. Roland Thaxter.

The Natural History Museum Staff Association has arranged a special scientific reunion to be held at the museum (by permission of the Trustees) on Thursday, June 3, at 3.30 p.m., in connection with the Imperial Entomological Conference. The exhibits which will be shown will illustrate some of the problems of economic interest, or arising out of the war, which have been studied at the museum during the past few years.

The motion for the second reading of the Importation of Plumage (Prohibition) Bill was carried in the House of Commons on May 14. Lt.-Col. Archer-Shee expressed a wish to propose that it be an instruction to the Standing Committee by which the Bill will be considered to insert a schedule of the birds the plumage of which should be prohibited from importation, but the Speaker pointed out that it would be out of order to give a mandatory instruction to a Standing Committee, which could, if it wished, take such action without any instruction.

A notice from the Department of Anatomy, Johns Hopkins Medical School, Baltimore, Maryland, informs us that the Ellen Richards research prize offered by an association of American college women, hitherto known as the Naples Table Association, is available for the year 1921. This is the tenth prize offered. The prize has been awarded four times, twice to American women and twice to Englishwomen. The competition is open to any woman in the world who presents a thesis written in English. The thesis must represent new observations and new conclusions based upon laboratory research.

The medal of the Society of Chemical Industry for 1920 has been awarded to M. Paul Kestner in recognition of his distinguished services to chemical industry. The medal is awarded biennially, and among the recipients in recent years have been the Right Hon. Sir Henry Roscoe (1914), Mr. C. F. Cross (1916), and Sir James Dewar (1918). M. Kestner was born in Alsace prior to the German occupation in 1871; he was one of the chief founders and the first president of the Société de Chimie Industrielle in France, which was established in 1917. He has been connected with engineering as applied to chemical industry throughout his career, and among his more notable achievements are the use of forced draught in acid towers, automatic acid elevators, the climbing film evaporator, the scaleless water-tube boiler, and several inventions in connection with beet-sugar manufacture.

An invitation from the Mayor and Corporation of Barrow-in-Furness to hold the annual autumn meeting of the Institute of Metals in that town on Wednesday and Thursday, September 15 and 16 next, has been accepted by the council of the institute. Particulars of the meeting can be obtained from the secretary, Mr. G. Shaw Scott, 36 Victoria Street, S.W.1, who will also be glad to forward tickets for the tenth annual May lecture, which will be delivered by Prof. C. A. F. Benedicks, of Stockholm, at 8 p.m., on June 10, at the Institution of Mechanical Engineers, Westminster, the subject of the lecture being "The Recent Progress in Thermo-Electricity." The president, Engineer Vice-Admiral Sir George Goodwin, K.C.B., will preside.

A short account of the Department of Scientific Research and Experiment, which the Admiralty has set up under the Third Sea Lord, was given in Nature of April 22, p. 245. A vote for 302,000*l.* for scientific services under the Navy Estimates was agreed to in Committee of the House of Commons on May 17. Mr. Long, in reply to points raised concerning this vote, said that after an investigation into the conditions the Government decided to ask the Lord President of the Council, who was specially charged with the care of all scientific work in the country, to set up a Committee to inquire into the whole of the work done in the Government Departments in order to prevent overlapping, and to prevent two Departments doing the same work. The Admiralty had appointed a Director of Scientific Research at Teddington, where they were going to concentrate on naval scientific research. When it came to sea-water research they proposed that that should be carried out at the sea-ports. Teddington would be carried on this year, but they hoped that before the end of that time they would have the benefit of the report of the Lord President's Committee, and they would then be in a position to avoid overlapping and duplication of work. The Admiralty would not hesitate to ask Parliament for such money as they thought necessary to give the fullest effect to scientific research and the development of the results of that research. The sum of 430,300*l.* was voted for educational services, and Mr. Long said in connection with it that the departure, taken only recently, under which reception was secured at the University of Cambridge for a certain number of naval officers as undergraduates, had abundantly justified itself. He assured the Committee that the Government is extremely sympathetic to this scheme, and hopes to increase the number of officer undergraduates.

An interesting conference on "The Relations of the Inventor to the State," organised by the Institute of Inventors, was held at the rooms of the Royal Society of Arts on May 13. The discussion was opened by Mr. D. Leechman, who gave a good *résumé* of the present state of the patent law in the light of the new Patent Act. It was remarkable that in a meeting of this kind the whole of the speakers were unanimous in condemning the present attitude in official circles towards inventors. It was stated by more than one speaker that those who came forward during the war with ideas and inventions that had made our success possible had not only received no reward, but had in several cases been deprived even of the merit of their ideas by officials who were themselves devoid of the necessary technical or scientific knowledge. The chairman, Mr. Walter F. Reid, stated that the working of the Royal Commission on Awards to Inventors supplied abundant evidence of the difficulty experienced by inventors in obtaining any recognition. Although large sums were now being devoted to research, he pointed out that such work was only the raw material for the development of industry; it was the application of that raw material by the inventor which resulted in the advance of industrial processes. The mass of facts as ascertained by research was already enormous; what is now required is inventive genius to make use of those facts, which Mr. Reid compared to the bricks and stones with which an architect might produce a building, but which by themselves were of little practical use.

INFLUENZA, according to the Registrar-General's return for the week ending May 1, continues greatly on the decline over the whole country, the deaths for the ninety-six great towns numbering only 202 and in London 45. For the twenty-eight weeks from October 25, 1919, to May 1, 1920, during which influenza was practically epidemic, the deaths from the disease in London were 1160, and the deaths from all causes 35,276. Deaths from influenza were 3 per cent. of the total deaths, whilst the deaths from pneumonia were 11 per cent. and from bronchitis 10 per cent. Between the ages 0 and 20 the deaths from influenza were 15 per cent. of the total, 20 to 45 years 36 per cent., 45 to 65 years 28 per cent., and above 65 years 21 per cent. The age-incidence of the deaths calculated on the total deaths for the several ages was respectively 4 per cent. for 5 to 20, 8 per cent. for 20 to 45, and 4 per cent. for 45 to 65. The insignificance of this is shown when compared with the deaths during the virulent epidemic of 1918–19, in which during thirty-one weeks from October 19, 1918, to May 10, 1919, the deaths from influenza were 47 per cent. for ages 5 to 20 of those for the corresponding ages from all causes, 52 per cent. for 20 to 45, and 22 per cent. for ages 45 to 65. During the three weeks ending April 10, the worst stage of the present epidemic, the deaths between 20 and 45, the ages attacked most severely, were only 21 per cent. of the total deaths from all causes, whilst in the epidemic of 1918–19 the deaths for ages 20 to 45 in the three weeks ending November 16, 1918, were 73 per cent. of the total at the corresponding ages from all causes. In the present epidemic deaths were most numerous during a spell of exceptionally mild weather.

A BRIEF, but very interesting, study of the pygmies of Central Africa by Mr. Herbert Lang appears in *Natural History*, the journal of the American Museum of Natural History (vol. xix.), and its value is further enhanced by a number of most excellent photographs. Anthropologists will welcome this contribution, since it summarises the results of a prolonged study of these people made during the American Museum Congo Expedition (1909–15). During that time more than a hundred life-masks, representing sixteen different tribes of Central African races, were taken. Some extremely useful observations on the physical characteristics of the pygmies are made, as well as on their mode of life, customs, and language. By way of a supplement, perhaps, to Mr. Lang's paper, this number also contains an essay on "The Pygmy Races of Man," by Mr. Louis R. Sullivan, of the Anthropological Department of the American Museum, illustrated by a number of useful tables and diagrams.

THE eighteenth annual report of the Rhodesia Museum, Bulawayo, affords instructive reading. It is evident that but for the assistance the museum is able to afford the mining industry it would cease to exist. The public generally seems to regard the institution, at most, with but a mild interest. Hence, from lack of funds, every aspect of its work is hampered. The building is all too small to house its collections, and the provision made for the storage and exhibition of specimens is utterly inadequate. It is more than probable that if a better display could be made enthusiasm might be kindled. This state of affairs is lamentable, for, as matters stand, it is impossible to secure that record of the fauna and flora of this important area of Africa which is so essential in a country being rapidly transformed by the march of civilisation. Dr. G. Arnold, the curator, is evidently having an uphill fight; but, in the interests of science, it is to be hoped that the tremendous possibilities of a well-organised museum will soon be realised.

THE Pueblo stage of culture in south-western Colorado, New Mexico, Arizona, and Utah, the domain of the cliff-dwellers, has naturally attracted much attention. The material for studying it is wide and scattered, and it is well that a competent archæologist, Mr. J. W. Fewkes, has prepared a monograph on the subject, entitled "Prehistoric Villages, Castles, and Towers of South-Western Colorado," published as Bulletin No. 70 of the Bureau of American Ethnology. The general conclusions at which Mr. Fewkes has arrived are: The buildings express the communal thought of the builders, since they were constructed by groups of people rather than by individuals. The view that either the Pueblo people were derived from Mexican tribes or, as it was customary in the seventeenth and eighteenth centuries to suppose, their descendants had made their way south and developed into the more advanced culture of the Aztecs, is not supported by architectural data observed among these two peoples; it is preferable to assume that the custom of building stone houses was not derived from any locality not now included in the Pueblo area, but that it developed as a local growth, the earliest stages, as well as the most complex forms, being of local origin. That the buildings antedate the coming of the white men is shown by the absence of mention of them in any history; no European objects have been found at the Pueblos, and the buildings and pottery have no affinity with any villages inhabited when the Spanish entered the south-west.

Experiments with the Amphipod *Gammarus chevreuxi* by E. J. Allen and E. W. Sexton at the Plymouth Marine Biological Laboratory (*Journal of Genetics*, vol. ix., No. 4) have disclosed several mutations in eye-colour. In the wild animal the retinal pigment is black. A single individual with red eyes appeared in the second generation from animals brought into the laboratory, and the new character was inherited as a simple recessive. An albino-eyed type also appeared, in which the eyes differed in many structural features from the normal type. Another mutation, by no means uncommon, consists in the loss of the white pigment normally present between the ommatidea of the eye. This may appear suddenly or gradually, or may develop in the animals as they grow older. White-spotting also occurs on the bodies of these animals occasionally, but the rules of its inheritance show complications, and a pure spotted race has not been obtained.

In March of 1917 the Board of Agriculture and Fisheries appointed a Committee to consider the fresh-water fisheries. Attention was directed to the use of coarse fish as food, to the development of the eel fisheries, and latterly to the improvement of the salmon fisheries. Two interim reports were issued, and as a result of these the Board made an Order in March, 1918, extending, as a war emergency measure, the season of capture of coarse fish by one month. This Order was revoked in the spring of 1919. A further Order removing restrictions on eel-fishing and abolishing the close season for pike was made in April, 1918, and revoked in October, 1919. Dealing with the eel fisheries, the Committee recommended that the factory on the Severn owned by the German Fisheries Union should be taken over, and, "after prolonged negotiations," this was done. The factory exported some five millions of elvers annually to Germany before the war. Arrangements were made to carry it on, and in 1918 and 1919 about 2½ millions of elvers were distributed throughout this country. The Committee hopes this work may be continued regularly. In its final report, now published, practical methods of eel cultivation are dealt with, and the necessity for investigation into the biology of fresh-water fishes in general is discussed. Recommendations are made with regard to the pollution of rivers, improvements of the latter as breeding-grounds, and the consolidation of the law as to fresh-water fisheries. Practical suggestions for the cultivation of carp are given in an appendix.

Mr. W. B. Wright, of the Geological Survey of Ireland, has made "An Analysis of the Palæozoic Floor of North-East Ireland, with Predictions as to Concealed Coalfields" (Sci. Proc. R. Dublin Soc., vol. xv., No. 45, 1919, price 1*s.* 6*d.*). Mr. Wright accompanies his careful reasoning as to the synclines and anticlines produced by the Armorican and later foldings by a coloured geological map showing the intersections of two systems of folds, and therefore the probable domes and basins. He relies much on the repetition of similar fold-features in the same area during successive geological periods—that is, on the principle of posthumous folding on which R. A. C. Godwin-Austen based his prediction of the Dover coalfield. It is no secret that the deep boring put down recently by the Ministry of Munitions on the west shore of Lough Neagh in accordance with the arguments of Mr. Wright has more than proved his main contention, the Carboniferous rocks, on the line of the Armorican syncline of Central Scotland, having been carried down by Cainozoic sinking to depths completely unexpected.

The issue of the *Revue scientifique* for February 14 contains Prof. G. Friedel's opening address on his installation in the chair of mineralogy at the University of Strasbourg. Prof. Friedel, himself an Alsatian by birth, looks forward to the development of research in a university that will never become the slave of politics or the mere servant of industrial ideals. He says finely: "La science n'est pas la servante de l'industrie, elle en est la mère." His address deals with the insight given by the use of X-rays into crystalline and molecular structure, and he describes the work inspired by Laue, of Munich, in 1912 as "la plus belle assurément et la plus riche en promesses de la cristallographie récente." In the developments made by Sir W. H. and Prof. W. L. Bragg he perceives the end of our conception of the existence of molecules as such within a crystal, and a realisation of the crystal as one enormous molecule, in which the grouping of the atoms does not permit of a division into similarly constituted particles corresponding with the molecules of the chemist.

We have received from Koninklijk Magnetisch en Meteorologisch Observatorium, Batavia, the volumes of rainfall records in the Dutch East Indies for the years 1915, 1916, and 1917 (Regenwaarnemingen in Nederlandsch-Indië). The records are remarkably complete, and comprise data from several thousand stations scattered throughout the islands. There is no discussion of the data, but the volume for 1915 gives the mean of more than three hundred stations for the period 1879 to 1915. The same volume gives useful notes on the position and equipment of the various stations.

The Koninklijk Nederlandsch Meteorologisch Instituut has published the first part of an oceanographical and meteorological folio atlas of the Atlantic Ocean under the editorship of Dr. E. van Everdingen, director of the institute. The present part covers the months of December, January, and February, and is based on observations from 1870 to 1914. It follows the lines of the previous work on the Indian Ocean, and utilises mainly the observations of Dutch vessels, but these are supplemented by data from the Meteorological Office, London, and the Deutsche Seewarte. Maps for each month show the distribution of wind, currents, sea- and air-temperature, cloudiness, and floating ice. The volume of data which was to accompany the atlas has been delayed in publication.

The current (April) part of the Proceedings of the London Mathematical Society is of melancholy interest because it contains the conclusion of the late E. K. Wakeford's paper on canonical forms. The paper is remarkable for its generality and the simplicity which it gains by the use of the theory of apolarity. Moreover, certain results follow almost intuitively from known geometrical facts, *e.g.* the general ternary quartic cannot be expressed as the sum of five fourth powers, *because* the square of the conic through five points may be regarded, in this connection, as a quartic with double points at all of them. This example is interesting historically, because the original (and different) proof of the theorom in question was one of the first to show the untrustworthiness of the method of counting constants. Wakeford's premature death will be deplored by all who can appreciate the brilliance and originality of his work.

THE April issue of the Journal of the Röntgen Society contains the communication made to the society at a recent meeting by Prof. E. T. Jones on the action of the induction coil. By means of an electrostatic oscillograph Prof. Jones has investigated the effects on the potential of the secondary of the coil, both on open circuit and when connected to an X-ray tube, of changes in the capacity of the condenser shunting the break, and in the degree of coupling between the primary and secondary of the coil. He finds that the effects correspond closely with those to be anticipated on the theory that in the secondary on open circuit the potential after break consists of two component waves, which begin in opposite phase and have amplitudes inversely proportional to their frequencies. He considers that induction coils can be further improved by investigating and reducing the losses in the iron cores of the coils, by introducing interrupters which will break stronger currents without such large capacities in parallel with them, and by determining the best method of adjusting the coupling between the primary and secondary, either by alteration of their relative lengths or widths or by other means.

A VERY interesting example of the progress which has taken place during recent years in electric power supply is presented in a paper by Mr. J. S. Watson read on April 30 before the North-East Coast Institute of Engineers and Shipbuilders, in which he gave a brief historical sketch of the development of the generating stations of the Newcastle-upon-Tyne Electric Supply Co., the principal pioneer of electric power supply on a large scale in this country. Dividing the twenty-nine years of this company's activity into stages, Mr. Watson traced the progress from a small station with 2400 kw. in 200-kw. units to the latest addition, the Carville "B" station, with its five 10,000-kw. turbo-generators. Among the many important features referred to is the gradual decrease in steam consumption per kw.-hour from 28·5 lb. to 10 lb. An equally interesting comparison lies in the plant capacity per square foot of floor-space occupied, which is 15 kw. as against 0·3 kw., and other figures showing gain in economy are those of kilowatt capacity per man employed in the station—633 kw. and 141 kw. respectively. These improvements are attributable mainly to increases in boiler pressure, steam temperature, speed of revolution and size of unit, and to more complete utilisation of labour-saving appliances. Another no less important feature of the scheme is the running in parallel with the steam-driven stations of "waste-heat" generating plants at various points on the network utilising on a considerable scale by-product energy from coke-ovens and blast-furnaces.

IN a paper on the economics of the petroleum industry read recently by Mr. R. S. Dickie at the Imperial College of Science and Technology, there appears a series of well-justified criticisms relative to the geological, chemical, and engineering procedure of the producing companies. Such subjects as the proper spacing of well-sites, the economical utilisation of fuel by the provision of heat and cold interchangers, the preposterous waste in the current use of boiler-stills, the insufficiency of our present knowledge of lubrication and lubricating oils, the need for research on blended motor-fuel, and the possibilities of recovering valuable components from the crude oil by methods other than distillation were briefly touched upon. Among the more interesting statements made is the following: The greatest producing well is No. 4 Potrero del Llano (Mexican Eagle Co.), which ran wild for ninety days, flowing at the rate of 100,000 barrels per day. In the eight years of its life it produced 100,000,000 barrels of oil (1 barrel = about 45 English or 50 U.S.A. gallons).

WE have received from Messrs. A. Hilger, Ltd., 75A Camden Road, N.W.1, an attractive catalogue of their well-known wave-length spectrometer with high resolving power accessories, including the Lummer-Gehrcke parallel plate, the Fabry and Perot etalon, and the Michelson echelon diffraction grating. At a time when the structure of spectra is receiving so much attention from physicists it is good to know that a British firm can still assist in supplying the very necessary "munitions" in the form of efficient scientific apparatus. As is well known, this firm has been able very largely to control the effects of lack of homogeneity in glass by interferometer methods, which should considerably improve the performance of such instruments.

READERS of NATURE in search of book bargains should obtain and consult Catalogue No. 187 just issued by Messrs. W. Heffer and Sons, Ltd., Cambridge, in which some 331 books in new and perfect condition are listed at greatly reduced prices. Among the works relating to science we notice the "Scientific Papers" of Prof. J. C. Adams; sets in different bindings of "Biologia Centrali-Americana," also separate sections of the work; Prof. J. Stanley Gardiner's "The Fauna and Geography of the Maldive and Laccadive Archipelagoes"; Hagen's "Atlas Stellarum Variabilium"; Hewitson's "Exotic Butterflies" and "Illustrations of Diurnal Lepidoptera"; Leech's "Butterflies from China, Japan, and Corea"; and a set of "The British Bird Book," edited by F. B. Kirkman.